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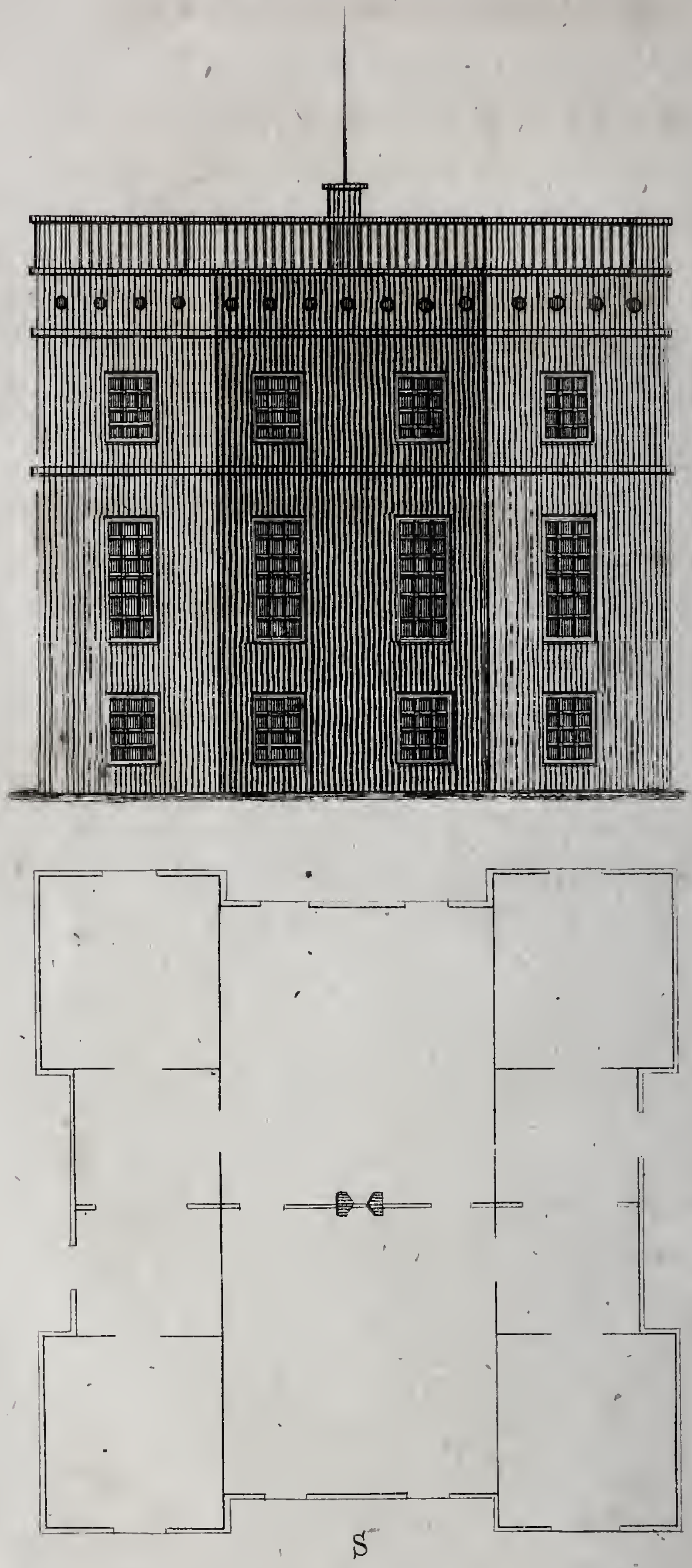
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COUNTRY HABITATIONS.

SECURITY againſt *Fire* and *Banditti* is peculiarly deſerving of attention in building Country Habitations; detached as they are from the immediate aſſiſtance of neighbors.

In the time of the revolution war I loſt two houſes by fire, from accidents; and living on a navigable river, the houſe in which I then reſided was beſet in the night by a number of armed men. Their numbers could not be known, nor could they be repelled from within, otherwiſe than by firſt opening the door. They were let in upon terms. The houſe was badly conſtructed for defence; and I always diſliked the common mode of building, with combuſtible materials, without reſerve, eſpecially in the roofs. The annexed drawing, of a plan and elevation, may afford hints to perſons who would build near rivers, or would effectually guard againſt fire. It is not here the intention to give a deſign to be particularly followed; but *principles* only on which others may build to ſuit themſelves.

The floors of baſement ſtories in dwelling houſes, are wholeſomer and better when *ſolid* and of the common *earth*, naked or laid with brick, ſtone, or cement, than floors laid upon joiſts over cellars or near the ground. Floors laid on joiſts near the ground or over cellars, confine a damp air under them long enough for becoming an unelaſtic dead air; which producing a mouldineſs and ſmell of vaults, gradually is mixed with the air of the rooms above, ſo as to be even ſmelt in ſome. Delicate people, uſed to dry warm houſes of the towns, ſeldom take a cold on ſleeping in log pens or houſes having *damp earthen floors*, when they travel in the frontier of the country.

Court houſes and other ſtone or brick buildings, which are not airy, when ſhut up for ſome time, contain a ſomewhat ſtagnant unelaſtic damp air, which is alſo unwholeſome: but this is not at all the caſe of *inhabited*, *much-frequented*, or *airy* houſes; when the air has ſome degree of current, and is all *alive*.

The floor of a baſement ſtory may be of brick or flagſtone upon the ground. The ſecond or beſt ſtory to have its floor laid with rough ſtrong boards or plank, only three or four inches wide, nailed down acroſs ſtrong ſtiff joiſts, and covered with a thick bed of a ſtrong cement, the colour whereof ſhould yield to utility.* Carpets may cover the whole. The waſh-boards and ſurbaſe may be of cut ſtone or marble. The floor of the third ſtory to be laid with thick narrow boards and cement as the firſt; but the waſh-boards to be of cement rounded off. Cellars to be under a detached building, or under the ſtaircaſe, or ſome one room of the principal houſe.

Wood is to be avoided as much as poſſible. The door and window frames may be of ſtone or iron. The joiſts and boards for the platform roof and floors, alſo for the ſtair caſe if this ſhould be of wood, are all to be defended from contact of fire by cements. No outſide cornish is requiſite to a platform roof.

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* Pieces between the joiſts ſtiffen them and prevent lateral weakneſs.

All the houſes of the ancient civilized world had, and moſt of the Aſiatic and African houſes on the coaſt of the Mediterranean ſea, ſtill have platform roofs. The houſes in Algiers are all ſo, and of one height; ſo that the ladies viſit from houſe to houſe and ſtreet to ſtreet, by walking on the roofs of the houſes. Platform roofs are cheaper than common ridge-roofs, ſhingled; and are ſafer againſt fire inſide and out, and againſt the preſſure of wind. Moſt houſes burnt in country places take fire in the roofs whilſt the family is gone on viſits or to church. Then it is that children or ſervants take candles or light-wood to rummage cloſets, cuddies, and cock-lofts, which uſually are lumbered with combuſtibles: or flakes of burning ſoot fall on the ſhingled roof.

A platform roof may be thus conſtructed. Joiſts 12 or 13 inches deep at the big end, are to reſt on the middle wall, and from thence ſlope two-tenths of an inch per foot to the ſmaller end on the exterior wall. Their thickneſs 2 5-10 or three inches. The diſtance between them 12 or 14 inches, from centre to centre. Or the joiſts may be equally deep from end to end; and battens which ſlope are to be fixed on the joiſts, for forming the platform roof with the ſaid degree of ſlope. Between the joiſts, at every five or ſix feet, fix to the joiſts at right angles, pieces of plank, nearly the depth of the joiſts. Theſe would add to the ſtrength of the joiſts, as ſo many braces, preventing their weakneſs laterally. Stout, rough, narrow boards, 3 or 4 inches broad, are nailed down acroſs the joiſts with large nails ; the better if ragged. The ſun is powerful in drawing nails. On theſe lay a cement an inch or two thick, whilſt it is hot in ſlacking the burnt powdered limeſtone one part, mixt with clean ſand and brick-duſt two parts. No more at a time is to be ſlacked than what the trowels can mix and work up whilſt hot.* When the cement is dry, in a hot ſunſhine day, with a bruſh lay upon it hot *tar* three or four parts, and of *fiſh oil* one part, well mixed together over a gentle fire. This coat may be repeated. Forbid walking on it for months after. Fiſh-oil corrects tar in its faculty of letting water through it ; and the mixture gives a cloſe varniſh. After this, lay upon the cement tar and fiſh-oil boiled down together till they become *half-ſtuff*,† and ſift very coarſe ſand or ſmall pebbles over the whole. Over this lay more *half-ſtuff*, now without oil, and more ~~ſand with~~ pebbles, without ſand.‡

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* Doſſie. In ſlacking no more water is uſed than what will well wet through the heap of ſand : then to this add and mix up the unſlacked burnt limeſtone in powder; and be careful never to *drown* the maſs for a moment. This fault would be incurable.

† What in Maryland are called *inch-planks*, are *boards* in Pennſylvania. *Tar*, long boiled, produces *pitch*. When tar is but half boiled down, to a medium thickneſs, between tar and pitch, it is then called *Half-ſtuff*.

‡ It may be a better way to lay on a *bed of the ſand or pebbles dry*, and then, levelling it, pour on hot tar, or tar and oil, barely to ſoak through the bed. So it is, a gentleman of Carolina informed me he made beds, of a ſandy ſoil, formed ſomething higher than the common level of the ground, for thraſhing out his rice crops. With gourds were gradually poured upon one of theſe beds, many barrels of hot tar. After a while the beds be-

Mr. Latrobe permits me to give here the compoſition of a cement uſed by him, and the manner of applying it to platform roofs. " The floor muſt riſe about two or three inches in ten feet (two or three tenths of an inch in a foot.) Firſt, lay a floor upon the *Rafters*,* of narrow well-ſeaſoned plank cut into ſlips not wider than four inches. 2dly. Lay down upon the floor with *boiling tar*, a coat of *ſheathing paper*, ſuch as is uſed for ſheathing ſhips. 3dly. One buſhel pounded chalk, or *unſlacked lime*, or *lime ſlacked in the air*, or of *water ſlacked lime dried and pounded very fine*. Two buſhels *clean coarſe ſand*, and as much *tar* as is neceſſary to reduce it to a ſubſtance that will ſpread *toughly when hot*. The tar muſt be boiled and the materials *gradually* mixed with them till they are in a proper ſtate to lay on the paper. The ſtratum may be three quarters of an inch thick. Skreen *gravel*, ſo that the largeſt particles may be as big as large ſized peas, and none much leſs than ſwan ſhot. Take a *very hot day*, when the compoſition is ſomewhat ſoftened by the heat of the ſun, and with a garden roller, *roll in* as much of this gravel as it will take. The floor will then be a beautiful pavement, reſembling Scagliola, and may be worked in moſaique.

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came like ſtone. Many years ago, I was ſhewn the kitchen of Captain Lux of Baltimore. It was a houſe which had been uſed for ſtoring barrels of tar. The floor was now a compoſition of tar and earth, and appeared like ſtone. I chiefly noticed the fire-place, which alſo was a compoſition of tar and earth, appearing like ſtone, and being quite incombuſtible. So on wharves are ſeen *old* ſpots, where tar had been ſpilt, which cannot be burnt.

* For ſo flat a covering or platform, *rafters* are uſeleſs, and expenſe is ſaved. The *joiſts*, a little ſloped, ſuffice ; or battens upon the joiſts may form the ſlope.

This covering is ſo light, that very little timber is required in the roof."

Objections readily occur to new projects; and it is right that they ſhould be well weighed and conſidered. It is ſaid platform-roofs may anſwer in ſouthern climates; but that in our more northern country, the weight of ſnow would be too great to be borne. This objection has the leſs force with me, who have had ſome experience on this head. I covered a houſe, thirty-ſix feet ſquare, with a flat roof which ſloped about a quarter of an inch to a foot The joiſts of poplar were two feet apart; nine inches deep at the upper end (the ridge of the roof) and about ſix and a half inches at the ſmall end, where they reſted on a wall. From the ridge to this wall was ten feet in length, and the joiſts from thence continued tapering further eight feet, where they reſted on a plate ſupported by brick pillars. Pine ſawed laths, inch thick, were nailed acroſs the joiſts. Common weak oyſter-ſhell mortar, from old Indian collections of ſhells, was laid on the laths, three-fourths of an inch thick. Tiles ſix quarters of an inch thick were bedded in the mortar. The joints were filled with tar and ſand; and the tiles and joints were covered and filled with half ſtuff, on which ſand was ſtrewed thick and rolled. A guſt of wind carried off moſt of the ſand. Then again half-ſtuff and ſheathing paper were laid on; and upon the paper half-ſtuff, ſand and pebbles. Guſts of wind blew moſt of the paper off. It remained only on the roof over one of the rooms; which was tight, excepting in one place, where rains poured through, till a ſingle thin coat of *tar and fiſh-oil*, laid on hot with a hair bruſh, totally ſtopt the leak. This roof bore the ſnows of near twenty winters, in Maryland, without the leaſt attempt to ſhovel off the ſnow. Hav- given the place up to my ſon, he had occaſion to pull down the houſe.

The leaking in this experiment was the more exceſſive, from the mortar being made of rotten ſhells; which made an imperfect cement: and moreover, too much was expected from tar and pitch, as reſiſters of water; when in fact they let it through rapidly; until mixed with fiſh-oil, which proved to be a perfect corrector: neither was the paper properly fixed; for it could not be nailed down. Though the joiſts were of a brittle wood, ſlender and diſtant from each other, yet the ſpan from wall to wall was but about nine feet.

In the annexed plan is a main partition wall, acroſs where the chimney is, from whence the joiſts extend 21 feet to the exterior wall. The weight of extraordinary quantities of ſnow and ~~heat~~ sleet often repeated in the courſe of a winter, is to be guarded againſt. If there was no chance of omiſſion to ſhovel off the ſnow every time it ſhould fall, leſs ſtrength would be requiſite: but there probably would be neglect in this; or the houſe might happen to be uninhabited during ſome winter or other; I would therefore have the joiſts ſtrong and numerous, and the joiſts immediately below thoſe of the roof, ſhould be made to bear ſome portion of the weight, by planks between the lower and upper joiſts; which are to be about two feet, the depth of the ſpace given for the external air to paſs through and carry heat from under the platform roof, ſo as to cool the work and chambers, and admit a perſon to go between them and examine leaks, &c.

Another objection is, that ſudden changes of the weather between great heats and torrents of cool rain, are very trying. But it is pretty certain that attention in the choice of the materials and laying on the covering will be effectual in reſiſting injuries from the weather; eſpecially when relieved from much heat by the vent between platform and ceiling.

The ſtair caſe in the above deſign may be beſt in one of the corner rooms, or paſſages. The cellar may be under it. To make theſe corner rooms otherwiſe than ſquare, would give them the appearance of an old caſtle, if rounded, and of a modern fortreſs if the extreme angles were made at all acute; which is to be avoided. It is in all things to ſupport the character of a houſe, a mere habitation. Wood on ſtair caſes may be coated over with a cement.*

Preſerving the principles, and the form; the ſize will be accordiug to the ability and diſcreet views of the proprietor. In the annexed plan, the

		Feet.	*Feet.*
2 Paſſages are in the clear	23 by 9 5-10 each	218, both	437
4 Rooms, the corners	12 by 12	114	576
2 Ditto, - -	20 by 21	420	840
		Whole area	1853

The drawing is of an elevation and plan fronting ſouth. The entrance is at either of the ſides, eaſt or weſt. There are objections to balconies: but if deſired, the eaſt and weſt ſides of the houſe are to be preferred, for having ſhade in the morning on the weſt, and in the evening on the eaſt. The width may be 2 5-10 feet of the receſs, and 5 5-10 projecting; making 8 feet the width of the balcony.

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* Nothing is ſaid of any uſe of the *flanks*, formed by the receſſes of the exterior walls: though holes in them would effect much good in airing the rooms. Among a civilized people, and in a *Country of Laws*, there *ought* to be no occaſion for any extraordinary application of them.

Between the ceiling of the uppermoſt ſtory and the platform roof, is to be a clear ſpace of two feet in depth, with holes through the oppoſite walls. The hot air will thus be carried off from the under part of the platform, and there will be a ſpace for examining leaks. The air holes in the walls may be 8 or 10 inches diameter, with wire or well tarred twine Lattices, for excluding birds; and during the winter, inſide cloſe ſhutters are tobe fixed.

A baluſtrade of plain banniſters ſquaring to 2 by 3 inches, thin ſide outward, and leaving clear intervals of 6 or 7 inches, will admit of ſnow being more freely blown off as it falls: otherwiſe a cloſe parapet of wall, ornamented with pedeſtals forming panels, would be preferable. Turned banniſters would not be ſo ſimply neat, nor admit of ſo much freedom to the ſnow being blown off, as theſe plain banniſters. Rope-netting or lattice would alſo admit of ſnow accumulating on the diagonal ropes and their angles.

Height:	Baſement elevation of the walls	9 + 1 = 10 feet.
	Second ſtory,	12 + 1 = 13
	Third ſtory,	9 + 1 = 10
	Vent ſpace,	2 + 1 = 3
	Whole height	—36

In proportion as the walls are *high*, they ſhould be thick and ſtrong. The *three-ſtory* houſe would have 36 feet of wall above ground. A *two-ſtory*, would have 26 feet, and a *one-ſtory* houſe would have 15 feet. So that if one ſtory requires a wall 1 brick thick, two ſtories may have the baſement 1½, and three ſtories 2 bricks thick : or ſay 1½, 2, 2½ bricks thick, the baſement or firſt ſtories. The foundation wall ſhould be three feet in the ground, for gaining firmneſs and to be out of the reach of ſevere froſt.

It may be ſufficient for ſome families, and beſt ſuit their purpoſes to have but *one* or *two* ſtories of rooms. The lower the walls the ſtronger. It would be no great taſk to force water up, every evening in ſummer, for cooling the roof and other purpoſes. At Algiers, much of the women's work is done on the roof, where water is always at hand. They eſpecially waſh and dry their linen there. In Spain, they have their cloacas on the platform roof ; where alſo are two ciſterns of water : one for the uſe of the cook, the other for more common purpoſes, waſhing, &c. From this the pipes of the cloacas are ſluiced. At Cadiz, water is received into the ciſterns on the tops of the houſes, from reſervoirs or heads of water on the hills out of the town. Water might be raiſed to a head at the top of Mr. Morris's Quarry Hill, on the Schuylkill, for ſupplying reſervoirs on the tops of the houſes in Philadelphia. Conſult ingenious men. The tide falling eight feet ; and running 2 5-10ths miles in an hour, at leaſt equal to the walking of horſes in mill-work, could not works be ſo conſtructed that the impetus of the water of that river ſhould move a wheel (I think a horizontal one) that would force the water wanted up to the head on the top of that hill? A horizontal wheel under water would forever turn one and the ſame way, whether the water runs ebbing or flowing; as above twenty years ago I experienced in a model.*

The *baſement* and *ſecond ſtories* may be divied according to the views of the builder, rather than by the annexed plan. The *third ſtory* having the four ſquare rooms at the corners of the plan thrown into cloſets, about 2 5-10ths feet deep, will admit of the thin partition as above laid down, to be omitted; and then the whole area (clear of the cloſets propoſed) will divide into four roomy bed-chambers.

The middle wall croſſing the paſſages and dividing the large rooms, will bear moſt of the weight on the roof, and muſt therefore be particularly ſtrong. The joiſts of the platform run from this wall north and ſouth to the exterior walls.

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* Thus from water thrown up, every houſe might have *family baths*; the moſt important of all building-improvements for the health and comfort of families, that can be adopted in our climate eſpecially. You now riſe from bed and waſh face and hands—your tip ends. Why not riſe and plunge into your waſh-baſon—a bath adjacent to your bed-chamber? inſtead of uſing a gallon veſſel of water, only for hands and face! Every family in this fine climate ought to have its *bath*; and when there are ſervants, proper bathing places ſhould be provided for them.

Bathing moiſtens, ſoaks, waſhes, ſupples and refreſhes the whole body. When the water is *tepid*, bathing is always ſafe, cleaning and refreſhing; when *cold*, or made more than blood *warm*, it is wholeſome or not according to the ſtate of health; but is very beneficial in many caſes, when well adviſed to uſe the one or the other, according to the ſtate of health.

The receſſes of the walls are ſhallow as may be; 1 5-10 foot clear of wall will do. If *deep*, they retain or concentrate heat, and harbor muſketoes.

If the corner rooms be 10 feet ſq. or 100× 4=400 feet,
The middle rooms 18 by 20 ft. ſq. or 360× 2=720
The paſſages 7 5-10 by 25, or 187× 2=374
Whole area 1494

Conſtruction of chimnies to the beſt advantage is very important; yet, till lately, the principles have been but little underſtood. Mr. Peale, of the Muſeum in Philadelphia, has given me ſome account of the fine effects of his patent improvements, and ſays, that “Fire-places which were uſed to ſmoke, on his principles are cured of ſmoking; and ſuch entire command is had of the draught of air, that with but little of attention to the ſtate of the fire, as to its burning clear or not, by moving the ſliding mantle downward for increaſing the draught, then returning it for letting the heat into the room, and cloſing the valve in the throat of the chimney, juſt far enough for carrying off the watery particles of the fuel, only a ſmall portion of the heat is ſuffered to eſcape up the chimney: conſequently with very little conſumption of fuel, even large rooms may be kept comfortable in the coldeſt ſeaſons, as during the laſt winter he continually experienced; and the houſe is perfectly ſecure from any fire left in the fire-place at night.” I have in the late winter ſeen one of Mr. Peale's fire-places in its improved ſtate, where the room was uncommonly large, 26 by 25 feet ſquare and 15 feet high. On inquiry, it was aſcertained to me that during the winter only ſmall fires were kept burning from the morning, about ſeven o'clock till nine or ten at night, when it was let go down, and the family left the room to go to bed ; that it preſerved a warmth, not leſs than 48 of Farenheit, in the room till the fire was renewed next morning ; and this was the caſe in the coldeſt nights, when out of doors the thermometer was at 10 degrees. That in the day the heat was ſteadily kept at about 60 degrees. There is, next door to mine, a fire-place very noted for ſmoking. After many vain attempts to cure it, it was cloſed up with brick-work, plaiſtered over, and ſo remained till lately, when Mr. Peale directed his improvements to be applied to it. Now it is perfectly free from ſmoking in the very worſt of winds and weather. What further proved to me the due portion of heat having been ſteadily preſerved in Mr. Peale's above room, during the winter, was the high perfection in which, in March, I ſaw in it a collection of green houſe-plants, oranges, &c. that had ſtood there the winter through. The room had two windows fronting weſterly, and two ſoutherly, and I never ſaw green houſe-plants more perfectly kept.

B.

July 1798.